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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/090,166 | 03/05/2002 | Yoshimasa Sakata | Q68207 | 5464 |

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| EXAMINER | |
|---|---|
| HON, SOW FUN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1772 | |

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/090,166 | SAKATA ET AL. | |
| | Examiner | Art Unit | |
| | Sow-Fun Hon | 1772 | |

*-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *20-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of claims 1-19, 25 in Paper No. 6 (filed 11/06/03) is acknowledged.

### *Specification*

2. The abstract of the disclosure is objected to because it is longer than 150 words. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 5-8, 13-17, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomohito (English Machine Translation of JP 2000-267086), as evidenced by Nakamura et al. (Derwent Abstract of JP 2002-234111).

Tomohito has a resin sheet containing dispersed particles (particulate material) having an average particle diameter of between several 0.01μm (translated from several 10 nm) and several 10μm (micrometers) (overlaps claimed range of 0.2 to 100 μm), in an epoxy resin layer

(transparent layer 4) which comprises the particulate diffuser having a refractive index (high refractive index) different from that of the epoxy resin (low refractive index) [section 0051].

The ratio (machine translated as rate) of diffuser (acrylic resin) to epoxy resin is 1:2 [section 0051] and is interpreted to be the ratio of weights. This 1:2 ratio then corresponds to 100 parts by weight of diffuser to 200 parts by weight (1:2) of epoxy resin, or 50 parts by weight of diffuser to 100 parts by weight (1:2) of epoxy resin. Applicant defines the parts by weight of the particulate diffuser to be parts by weight relative to 100 parts by weight of the epoxy resin (specification, page 15, 4th paragraph). Parts by weight of each component of a mixture is relative to one reference component whose parts by weight has been reduced to 100, instead of 1 as in a ratio. Thus the 1:2 ratio of diffuser to epoxy resin with the diffuser as the reference component, can be expressed mathematically as the 0.5:1 ratio with the epoxy resin as the reference component. This is equal to 50 parts by weight of diffuser to 100 parts by weight of epoxy resin. 50 parts by weight of particulate diffuser relative to 100 parts by weight of epoxy resin is encompassed by the claimed range of up to 200 parts by weight of diffuser to 100 parts by weight of epoxy resin.

Tomohito teaches that the other resin phase separates from the matrix resin and forms particles (other resin condensed in the shape of a ball) which float to the surface (came floating in resin) and form a rough surface (the shape of toothing) [section 0033]. This is the same mixed resin which forms transparent resin layer 4 [section 0051]. Applicant teaches that the diffuser is allowed to float in the epoxy resin in order to form the concentration distribution (specification, page 16, 4th paragraph). Thus the diffuser localizes so as to have a concentration distribution in the direction of the thickness of the epoxy resin layer as defined by Applicant.

Tomohito teaches a hard coat layer (hardened overcoat) on the transparent mixing layer 4 [section 0052]. The mixed resin layer 4 is formed on a thin metal layer (metal thin film) present as a reflecting layer (light reflex film) [section 0045]. Aluminum is given as an example of a metal thin film with a thickness of 150 nm (1500 Angstrom) [section 0057] which is encompassed by the claimed range of from 5 to 200 nm (claim 13). Aluminum is inorganic, and also functions as a gas and moisture barrier layer (claims 7, 16), with an oxygen permeability of 0.3 cc/$m^2$.24h.atm or less and moisture permeability of 10 g/ $m^2$.24h.atm or less, as evidenced by Nakamura et al.

Nakamura et al. teaches that aluminum film has oxygen permeability of 0.5 cc/$m^2$.24h.atm or less (abstract) which encompasses the claimed range of 0.3 cc/$m^2$.24h.atm or less (claim 5) and moisture permeability of 0.5 g/ $m^2$.24h.atm or less which is part of the claimed range of 10 g/ $m^2$.24h.atm or less (claim 14).

In addition, Tomohito teaches that the epoxy resin layer comprises a diffuser-containing layer (transparent mixing layer 4) [section 0051] and a diffuser-free layer (transparent layer 3) adhered thereto [section 0050] (claim 2). A color filter layer (claim 16) is positioned under the epoxy resin layer [section 0050]. The resin sheet is used in a liquid crystal display [section 0032] (claims 6, 15, 25).

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-4, 9-10, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomohito, as evidenced by Nakamura et al.

Tomohito has been discussed above, and teaches the resin sheet containing dispersed particles in an epoxy resin layer, wherein the particulate diffuser has an average particle diameter which overlaps the claimed range of from 0.2 to 100 μm, is present in an amount which overlaps the claimed range of up to 200 parts by weight relative to 100 parts by weight of epoxy resin, a reflecting layer comprising a thin metal layer which also functions as a gas and moisture barrier. The particulate diffuser localizes so as to have a concentration distribution in the direction of the thickness of the epoxy resin layer, and has a refractive index different from that of the epoxy resin.

In addition, Tomohito teaches that if the electrode is formed on the epoxy resin layer (light-scattering layer characterized by having surface irregularity formed by phase separation of the mixed resin) [section 0037], the epoxy resin layer being the outermost layer towards the electrode with respect to the other components listed in claims 1, 7, 16, as defined by the specification (page 25, 2nd paragraph) it needs to be formed on a flattening layer [section 0044]. Thus Tomohito teaches that the electrode needs to be formed on a flat and hence smooth surface, without the roughness (toothing-like) of the spherical particles protruding from the surface of the epoxy resin layer. Therefore it would have been an obvious variation to one of ordinary skill in the art to provide a smooth, flat outermost-side surface of the epoxy resin, instead of an additional smoothening flattening layer, for the deposition of the electrode film.

Tomohito teaches that the difference in refractive index between the particulate diffuser (acrylic resin refractive index 1.56) and the epoxy resin (refractive index 1.43) is 0.13 [section 0051] which is right outside the upper limit of 0.10 of the claimed range. In the absence of a showing of unexpected results, the claimed difference in refractive index of 0.03 to 0.10, between the particulate diffuser and the epoxy resin, is the result of routine experimentation extending from the difference in refractive index of 0.13 taught by Tomohito, in order to obtain the desired light diffusion.

7. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomohito as applied to claims 1-10, 13-19, 25 above, as evidenced by Nakamura et al., and further in view of Shi et al. (US 5,693,956) as evidenced by Misono et al. (US 4,070,749).

Tomohito has been discussed above and teaches a thin aluminum layer which is reflecting, and also functions as a gas and moisture barrier as evidenced by Nakamura et al.

Tomohito, however, fails to teach that inorganic silicon oxide or silicon nitride are used as barriers alongside or in place of inorganic aluminum.

Shi et al. teaches that aluminum, silicon oxide such as $SiO_2$ wherein the ratio of the number of oxygen atoms to that of silicon atoms is 2 (claim 11), and silicon nitride such as Si3N4 wherein the ratio of the number of nitrogen atoms to that of silicon atoms is 4/3 (claim 12), are equivalent in that they also function as barrier layers to reduce or eliminate the permeability (diffusion) of oxygen and moisture (column 3, lines 5-20). These barrier layers are used in displays (column 1, lines 10-15) wherein they protect components which are susceptible to oxygen and moisture in the surrounding atmosphere (column 2, lines 55-70). Although Shi et al. only teaches light emitting displays (column 1, lines 10-15), it is addressing the problem of

oxygen and moisture which the light emitting displays have in common with liquid crystal displays, as evidenced by Misono et al.

Misono et al. teaches that the liquid crystal in liquid crystal displays is affected by oxygen and moisture in the air (column 1, lines 20-25). Thus it would have been obvious to one of ordinary skill in the art to have used silicon oxide or silicon nitride as taught by Shi et al. alongside or in place of the aluminum as a barrier layer in the display of Tomohito in order to obtain a display with the desired oxygen gas and moisture barriers.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 9:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1300.

Sow-Fun Hon
01/23/04

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

1/26/04